

**U.S. EPA Coalbed Methane Outreach Program (CMOP)
Roundtable Meeting:
Coal Mine Methane Carbon Finance Opportunities**

23 July 2008

Revised Meeting Summary

Pamela Franklin, Team Leader for U.S. EPA's Coalbed Methane Outreach Program (CMOP), welcomed the participants and expressed her appreciation for their time and effort to contribute to the roundtable. Ms. Franklin explained that the primary purposes of the roundtable are information sharing and networking; to learn more about the CMOP program and meet with the team members (Jayne Somers and Barbora Jemelkova); and to learn about the needs and concerns of the finance / project development community. She acknowledged the roundtable's format was a departure from CMOP's traditional events and conferences, in that it is focused on the perspectives of financiers and potential project developers, with a relatively intimate and informal format.

Ms. Franklin commented on the rapidly changing and evolving carbon market and the role that coal mine methane (CMM) projects might play. There is starting to be great interest in this area and EPA seeks to understand the stakeholders' needs and concerns. The United States is a leader in CMM recovery, with important opportunities for CMM recovery including recovery and use of ventilation air methane (VAM) and abandoned mine methane (AMM). Although CMOP is actively involved in international projects through its work with the Methane to Markets Partnership, the roundtable has a U.S. focus. Ms. Franklin acknowledged that changes that are likely in the climate change policy arena associated with the pending administration change and election.

Ms. Franklin introduced Dianne Rudo with Rudo International Advisors as the moderator for the roundtable. Ms. Rudo welcomed the attendees and reviewed the roundtable's objectives to create an informal atmosphere and provide an opportunity for stakeholders to become familiar with the CMOP staff as well as peers. Ms. Rudo reviewed the day's structure and agenda (see Appendix A). Biographies for all of the speakers can be found in Appendix B.

Presentation: Identifying U.S. Coal Mine Methane Project Opportunities
Pamela Franklin, Barbora Jemelkova, and Jayne Somers, US EPA CMOP

Ms. Franklin described CMOP as a voluntary program, initiated in 1994, with a mission to promote the profitable recovery and use of CMM by working cooperatively with coal companies and related industries, and increasingly with carbon financiers and investors.

- The program focuses primarily on CMM versus virgin coalbed methane (CBM).
- Methane is an important greenhouse gas (GHG): more potent than carbon dioxide, but shorter atmospheric lifespan. Aside from its GHG impacts, venting CMM to the atmosphere also wastes a clean-burning energy source.
- There are several important types/sources of CMM (e.g., VAM, drained gas, abandoned mines, surface mines).
- CMM end-uses depend on the gas quality (e.g., high quality for natural gas pipelines, medium quality for power generation, and low quality or VAM for oxidation). In the United States, most of the recovered CMM (from drained gas) is reinjected into pipelines. If the medium gas is upgraded, the number of uses is expanded and reinjection can be an option. There is also increasing focus on uses for the low quality gas.
- Profile of U.S. CMM sector today: U.S. coal production and CMM emissions – estimated from EPA's annual inventory, which is considered a world-class center for developing GHG estimates. According to EPA's estimates, VAM represents more than half of the U.S. CMM emissions.
- CMM projects are larger in scale and complexity compared to landfill gas (LFG) projects.

- Emissions avoided through existing CMM projects. Most existing projects are located at active underground mines in the Eastern US or at abandoned mines in the Illinois basin, with only one surface mine project in Wyoming. Despite being the highest percentage of CMM, there have been no VAM reductions achieved to date.
- Outlined the keys to project success over the last 15 years, including gas resources/production, integration with mining operations, gas rights, market incentives, and access to markets. Several of these factors explain relative number of projects in Eastern U.S. compared to Western U.S.

Dr. Somers provided an overview of U.S. project opportunities at active, abandoned, and surface mines and referenced CMOP publications. CMOP seeks to assist stakeholders in understanding the data in those documents.

- General rules of thumb for assessing “gassy” underground mines depend on several key factors (e.g., gas content, quantity liberated) and pursuing degasification.
- Potential projects from degas systems at active Underground coal mines: Despite challenges in the West (federal land ownership, rugged terrain), CMOP has identified several mines as good near-term candidates for project development.
- Mitigation opportunities and challenges associated with VAM from active underground mines. VAM represents excellent opportunity for carbon projects since the infrastructures are already in place and no VAM projects have been undertaken.
- Abandoned mine projects: increasing opportunities will come available as more mines age and are taken out of service. It might be difficult to predict future gas resources over time.
- Degasification at surface mines also present project opportunities but might include challenges such as gas ownership.

Ms. Jemelkova reviewed how the program’s activities fulfill CMOP’s mission.

- Technical information and outreach
- Federal agencies coordination
- Technologies demonstration
- Constituent education
- Information sharing and networking
 - Upcoming CMOP conference to be held 28-30 October 2008 in Pittsburgh. CMOP will have a presence at the National Mining Association’s MINExpo and the upcoming Annual International Pittsburgh Coal Conference.
 - CMOP’s Web site showcases program’s documents and tools available—including the *Coalbed Methane Extra* newsletter, *CBM Note* e-mail, etc. The most popular documents or links are called out on the right-hand margin.
 - The CMOP Network, a sortable list of companies affiliated with CMM/CBM.
 - International Projects Database, developed under the auspices of Methane to Markets.
 - Overview of the forthcoming Web-based, cost-benefit analysis tool to help evaluate project profitability.
- In summary, Ms. Jemelkova reiterated CMOP’s mission and welcomed suggestions for future tools, resources, and project support as well as feedback on the Web site.

Questions / discussion highlights:

Mr. Jeff Liebert (Verdeo Group): where does EPA get its raw data (e.g. abandoned mines)?

- Dr. Somers: a lot of the information is provided by CMOP’s contractor, Raven Ridge Resources (RRR), based on land owners in county records and data maintained by the Mine Safety and health Administration (MSHA) after 1972.
- Mr. Jim Marshall (RRR): confirmed that MSHA is an excellent source for property ownership data after 1972. The U.S. Geological Society (USGS) might have information for pre-1972

abandoned mines. Most of the information is publicly-available but very poorly organized so it requires legwork.

- Ms. Jemelkova: EPA has a good relationship with MSHA and therefore has been able to get information more relatively easily.

Mr. Jon Thomas (Energy Developments Inc.): what is EPA doing with regards to renewable portfolio standards (RPS) and working with/at the federal level to include CMM recovery in RPS?

- Ms. Franklin: EPA, as part of the executive branch, cannot engage in lobbying activities. EPA staff can provide information in response to Congressional requests. CMOP is tracking which states have incorporated CMM into RPS and/or state definitions of alternative energy.
- Dr. Somers: Pennsylvania includes CMM as part of its RPS. The program has been in communication with and provided information to other states (e.g., Virginia). EPA cannot lobby but would be happy to provide information to state officials.
- Ms. Jemelkova: many states with RPS do not have coal reserves (therefore, CMM is not included). For other states, it has been a tough argument for coal to be considered a “green” or renewable energy source.
- Mr. Charles Estes (Appalachian-Pacific): the job for stakeholders around the table was to make sure policymakers requested the type of information that CMOP can provide.

Mr. Estes: it might be more accurate to refer to abandoned mines as “closed,” since most of them are not truly abandoned (that is, someone still owns and is essentially responsible for them).

- Mr. Ron Collings (Ruby Canyon Engineering): according to MSHA, the term “closed” is reserved for inactive sections within active mines. The term “abandoned” is used to describe mines that are no longer under MSHA’s jurisdiction / no longer active. He said the differential was also important to the Clean Development Mechanism (CDM) project criteria, which requires mines to be active.

Mr. Ben Patton (3Degrees): are mines were provided with any incentive(s) to destroy and/or capture methane rather than simply venting it to the atmosphere?

- Ms. Franklin: there are no regulations for any action to reduce fugitive methane emissions on the parts of the mines.
- Mr. Estes: gas ownership rights—or lack thereof—also play a part when there is no mandate to reduce emissions.

Mr. Paul Augustine (RNK Capital): does CMOP maintain a mine ownership database (for abandoned mines)?

- Ms. Franklin: CMOP has tried to the extent possible and also relies on MSHA data, but it is a daunting task.
- Mr. Marshall: for closed mines, the lease reverts back to the previous [land] owner so it might be difficult to know who conducted the mining activity.
- Dr. Somers: ownership information changes frequently so it would be up to the project developer to do the leg work (e.g., research at the county seat) to determine/verify current owner(s).
- Ms. Jemelkova: the CMOP document on gassy mines does designate ownership but is subject to change.

Mr. Liebert: what requirements, if any, have been placed on CMOP and/or the regulatory arm of EPA in advance of the election?

- Ms. Franklin: EPA has started work on a draft rulemaking for GHG reporting requirements as called for in last year’s omnibus spending bill, with the proposed rule due in September 2008 and the final rule anticipated by June 2009. The rule would require an inventory of upstream fuel suppliers and downstream emissions sources. CMOP staff have been working with EPA colleagues, the National Mining Association, and coal companies to facilitate information-

gathering and meet deadlines. In addition, EPA recently published an Advance Notice of Public Rulemaking that reviewed the agency's authority under the Clean Air Act to regulate GHG emissions reductions. The ANPR was the Agency's first formal response to the 2007 Supreme Court decision (*Massachusetts v. EPA*), regarding EPA authority to regulate carbon dioxide or other greenhouse gas emissions under the Clean Air Act (CAA).

Mr. Joe Fink (CNX Gas): what about mine ownership on federal lands?

- Ms. Franklin: Most of the Eastern U.S. coal lands are privately held and while there may be different owners / lease holders of the surface, coal, and gas rights, any disputes can be settled through negotiations, or legal means. In the West, the federal government owns much of the lands (e.g., BLM or USFS lands), including coal and gas (and other mineral) resources / reserves. On federal lands, parties must pay the federal government royalties to extract those resources (coal and gas). Where there are different leaseholders of the different estates (coal vs. gas), conflicts may arise. For example, an entity might have a lease to mine the coal but not necessarily have the gas rights, so it is not in their best interest to mitigate (rather than simply vent) escaping gas because they cannot claim ownership.
- Ms. Somers: The Bureau of Land Management (BLM) manages federal lands; project developers can express interest in gas rights options if they have not already been distributed.
- Mr. Marshall: In BLM lands in the West, gas rights are auctioned off through a highest bid process. In the case of one Colorado mine, the gas lease auction was withdrawn based on a technicality.
- Mr. Estes: the State of Colorado asked for the rights to be pulled based on the inventoried roadless area and concerns regarding what could (and could not) be done (e.g., access for equipment).¹ He also pointed to a Utah gas lease (associated with a mine) that was recently pulled based on uncertainty.
- Ms. Franklin: CMOP is trying to clarify with its BLM colleagues regarding that situation.

CMM Project Developer's Perspective

Sam McLaughlin and Joe Fink, CNX Gas

Sam McLaughlin (CNX Gas) provided a brief history of CNX and its evolution from gas recovery opportunities at Consol's Buchanan in Southwestern Virginia. The mine was utilizing gob wells and recognized a business opportunity to find an alternative to venting the gas. Once the project proved successful, they expanded the practice northward into Pennsylvania, despite lower gas content and less permeability. CNX Gas split from Consol in June 2005 and has since increased output from 2 million cubic feet per day (mmcf) in 2005 to 34 mmcf by 2008.

Joe Fink (CNX) provided an overview of the key factors for methane mitigation (e.g., improved mine safety and productivity, additional revenue, reduced GHG emissions) and further described the activities undertaken at the Buchanan mine (i.e., drilling VAM wells in the 1980s, expanding to pre-mining degasification wells). Today, CNX Gas is the lowest-cost producer in the Eastern United States and the safest operator in the Exploration and Production industry (i.e., more than 3 million man-hours without a lost time accident). Communications between CNX and the mine operations are critical, particularly as it relates to being able to react quickly. The factors affecting project economics included coal footprint (i.e., acreage), leases, market (e.g., good natural gas market in the Northeast year-round), and produced fluids handling. He emphasized that water handling could pose a big challenge.

He also described the key elements involved in exploration: thickness/depth, the coal's gas content, permeability, and gas and water quality. In the full production stage (i.e., post-drilling), CNX employs

¹ Inventoried Roadless Areas are a group of United States Forest Service lands that have been identified by government reviews as lands without existing roads that could be suitable for roadless area conservation as wilderness or other non-standard protections. <http://roadless.fs.fed.us/>

electronic logging information as well as gas and production fluid information (e.g., quality, quantity, production and dewatering time). Once everything checks out, CNX prepares a drilling development plan based on the core data revealed during exploration. Mr. Fink described the gas treatment (e.g., dehydration), gathering designs, and disposal options for managing produced fluids (e.g., underground injection, municipal wastewater treatment). He discussed the importance of developing a project team and undertaking public relations prior to full-scale development. He reviewed issues associated with identifying a site (e.g., searching land titles), permitting, and being environmental stewards during and after the project. Mr. Fink discussed the need to protect assets (i.e., security) to reduce risks from theft and vandalism. Lastly, he outlined the economic benefits to CNX for obtaining carbon credits (i.e., registered for more than 8 million tons of credits worth \$5.40/ton in recent trading).

Questions / discussion highlights:

Mr. Collings: since they are separate entities, how [well] do CNX and Consul work together?

- Mr. Fink: they rely on the electronic communications (i.e., notification system) with the mine plus hold regular meetings. Mine operations are always the #1 priority and gas collection is the secondary priority, particularly when it comes to safety.
- Mr. J. Michael Onifer (CNX): based on his experience as a mine supervisor and now approaching it from the gas side, putting mine priorities/safety is paramount and critical to the project's success. CNX has more control of the gas in Virginia than at facilities in the North.

Mr. Thomas: what is the gas quality and does it pipeline injection requirements?

- Mr. Fink: it depends on the depth of coal. CNX gas quality can vary from 1,000 British Thermal Units (Btus) in Virginia to 900 Btus in Pennsylvania (the gas quality criteria for pipelines is 967 Btus).
- Mr. Onifer: blending and processing might be necessary for fractured gas to manage its nitrogen, carbon dioxide, and oxygen content depending on pipeline requirements.

Mr. Mark Wasilko (AES): what is the cost associated with fluid disposal?

- Mr. Fink: for the Buchanan mine, it comprises about 17 percent of the expenses. The best option for dealing with fluids is processing in place versus having the fluids hauled off-site for treatment.
- Mr. Onifer: fluids can be very site-specific (e.g., brine versus fresh water).
- Mr. McLaughlin: wet seams are a bigger concern for everyone, including municipalities and permittees.

Mr. Estes: is the gob gas subject to MSHA regulations?

- Mr. McLaughlin: the gas itself is unregulated but the mine is required to submit a mine plan under MSHA.

Mr. Phil Coleman (DTE Methane Resources): what is the percent of gas from the various mine operations?

- CNX representatives: 11 percent of the gas is collected from sealed gob wells and the remaining 89 percent is collected from pre-mining drainage.
- Mr. Coleman: would CNX pursue gas collection from a seam without a mining plan in place?
- Mr. Onifer: yes, they would.
- Mr. Coleman: what is the time from project conception to drilling?
- Mr. Fink: it is a function of manpower and permitting.
- Mr. McLaughlin: the existence of roads and transparent land owners also makes a difference. He emphasized that equipment orders alone can take anywhere from 18 to 24 months, which also drives the process.

Mr. Eron Bloomgarden (EcoSecurities): inquired regarding cash flow from the carbon credits, the public's perception of CNX projects, whether it impacted future project design, and if CNX has changed anything based on its initial experience?

- Mr. Onifer: yes, public perception has been positive, which influenced other projects, and that looking at past projects is part of the evaluation process for new projects. CNX relies on the Chicago Climate Change (CCX) to handle marketing/sale of the carbon credits so that activity is not within CNX realm.

Ms. Jemelkova: please describe the degasification process at active mines.

- Mr. Fink and Mr. Onifer: fracture wells are used in advance of the mining activity and then the gob wells are used at the long wall. Once a longwall panel is sealed, they continue to operate the gob wells. Oxygen sensors are used to determine how long to pull the gas (e.g., below 5 percent oxygen content).
- Mr. Estes: has CNX ever been called upon to vent the gas faster?
- Mr. Onifer: only once in 8 years.
- Mr. Estes: is this scenario was modeled and/or are there alarms when oxygen reached low levels?
- CNX: it is not necessary given the ongoing (i.e., electronic) monitoring.

Mr. Marshall: how does CNX differentiate between pre-mining and seam gas? Can CNX convert fracture wells into gob wells as operations progress?

- Mr. Fink: while the wells are constructed using similar technology, fracture wells are typically smaller in diameter.
- Mr. Onifer: it varies by state but in Virginia, they are required to use wider gob wells for safety purposes.

Mr. Patton: is the CCX methodology range used to define CMM (i.e., below 50 meters and above 150 meters) and otherwise, is it considered CBM?

- Mr. Nathan Clark (CCX): deviation from that range was possible.

Mr. Coleman: what is the potential for roof cracking with horizontal drilling?

- Mr. Onifer: Mr. McLaughlin was utilizing vertical to horizontal drilling at his site. He would prefer the risk of a bad roof to the presence of excess methane and roof control technologies are quite advanced and more easily controlled than methane levels.

How EPA Can Assist Project Developers and Investors: Discussion

Pamela Franklin, Barbora Jemelkova, and Jayne Somers, EPA

Ms. Rudo explained the purpose of the short session was to solicit feedback on how EPA can assist project developers and investors. Ms. Franklin thanked the participants for a productive morning and hopes this session would help provide a framework of thoughts and/or ideas for the next year on how best to promote and approach CMM Projects. Ms. Jemelkova also mentioned the existing CMOP reports and requested input on possible future research needs (e.g., data for assessing VAM mitigation projects) as well as potential analysis (i.e., comparison of different methodologies). Ms. Franklin continued by saying CMOP would welcome input on its Web site and publications, as well as the format for this roundtable and whether a CMM101 seminar might be useful for other stakeholders.

Questions / discussion highlights:

Mr. Wasilko: could a CMM101 seminar be directed toward the mines as well?

- Ms. Franklin: CMOP was making a concerted effort during this roundtable to only have financiers in attendance but other seminars might be geared to mines.
- Mr. Wasilko: suggested using Webinars to reach people.

- Dr. Somers: acknowledged that might work well because typically, the mines do not come to the meetings.
- Mr. Estes: mines do not like to have to slow operations in order to attend meetings; gas recovery is such a small percentage of their potential revenue it might not be worth their time. He anticipates change will come with carbon regulations once they are required to reduce emissions.

Ms. Jemelkova talked about the spectrum of mine operators, ranging forward thinking to others that are simply business-as-usual. She wondered what kind of document might be helpful to demonstrate the need to get involved in advance of carbon regulations.

- Mr. Liebert commented that sometimes when you spend too much time educating your consumer, you miss the opportunity to sell them anything. He suggested developing a “cheat sheet” about the carbon process (e.g., what is it, how does certification work, what methodologies are used?). Ms. Franklin thanked him for his input and expressed that CMOP was also sensitive to activities that might hinder the efforts of financiers as well (e.g., perception of government).

Mr. Kevin Townsend of Blue Source, LLC commented on regulatory risk and the concern that mines might open themselves up to enforcement scrutiny for a mere 5 percent of revenue potential. The mines need assurance that they will not be penalized for trying to do the right things.

- Mr. Collings said that focus should be on early action versus lost opportunity if they act later. In response to CMOP’s solicitation for what reports might be needed, he added that the 2002 MSHA information on VAM shafts, concentration, volumes and mitigation plans would be useful to help identify projects.

Mr. Liebert: is there was a compilation of statutes (i.e., legal precedent) on mineral rights by states that might also help identify or rank where it might be [more] feasible to pursue projects? For example, it sounds as if Colorado is not working out that issue but perhaps Illinois has?

- Ms. Jemelkova: A *Coalbed Methane Extra* article in 2007 provided a table with such information (a copy of the article was located and circulated to the group).
- Ms. Franklin: CMOP had developed past reports on state-specific legal actions but they are now a decade old. EPA is not likely to “rank” states.
- Dr. Somers: there was a spike in project activity following regulation changes in Virginia.
- Mr. Wasilko: is there one person to go to for state answers?
- Ms. Franklin: all three CMOP staff would be happy to respond to inquiries.

Mr. Roger Williams (Blue Source, LLC): wondered how best to conduct outreach back to EPA and policymakers on behalf of the stakeholders.

- Ms. Franklin: CMOP staff are champions of the coal mining methane-related issues within the Agency and can identify appropriate channels to provide input to their colleagues.

Navigating Legal Challenges to CBM Projects ***Kyle Danish, Van Ness Feldman, P.C.***

Mr. Kyle Danish with Van Ness Feldman opened by describing his firm’s energy, environmental, and natural resources practice and explained that this area has been growing over the last decade, primarily out of energy concerns. He continued by outlining the legal uncertainties associated with emissions reduction projects such as: who owns the gas; what is the division of labor, risks, and benefits; is this an offset project (in advance of state, regional, or federal policies); and what are the standards, rules, and procedures. Regarding ownership issues (e.g., possible claimants), Mr. Danish said there have been a number of cases but the outcomes vary by state. He noted that mineral rights are the focus, particularly in the West. He explained the best legal strategy is to find out who has the best claim of ownership (i.e., due

diligence) and be sure to address the concerns of other estate holders (i.e., can not ignore surface owners if you are trying to access the minerals).

Mr. Danish also reviewed the division of labor, risks, and benefits (i.e., who does what? how?). There are multiple roles (e.g., credit marketer, project developer, operator) and different roles imply different levels of risks (e.g., regulations). Legal options include clear definition of the roles and the associated benefits, as well as mechanisms to distribute risks and responsibilities.

Mr. Danish turned attention to the policy and politics of offsets. He explained the difference between caps and allowances versus offsets, which must appear as an additional, unregulated activity. He also addressed concerns that carbon trading should not be an attempt to take pressure off the electricity generators to reduce emissions. It is up to the affected stakeholders to help educate the policy-makers and regulators about carbon trading. In determining whether CMM is an offset, Mr. Danish said the litmus test is whether the activity would be subject to a cap—and therefore, considered an allowance—or not. Other uncertainties include the number of credits that will be available and how much allowance can be met/achieved with credits. Currently, the language is too ambiguous and further action needs to be taken to resolve uncertainty. The best legal strategy, according to Mr. Danish, is to ensure that any contract covers all kinds of potential carbon value (e.g., voluntary credits, compliance offset credits, avoided allowance costs).

In regards to standards and procedures, there is a bigger unknown about what is out there and what is needed. Mr. Danish recommended including contract language that defines how the credits were derived (i.e., under which methodology) but indicated that the entity will need to comply with whatever federal standard that is later adopted as reasonable and for a fee. Mr. Wasilko interjected by asking about the role of EPA's Climate Leaders program. Mr. Danish responded that entities should search for a credible program that can withstand the test of time. He indicated it might behoove EPA to say "use the EPA protocol" rather than confuse Congress with multiple standards. Ms. Ashley King with EPA's Methane to Markets Partnership added that the Climate Leaders protocol has been mentioned in Congressional documents as a mechanism. Mr. Wasilko acknowledged that fact but said there was also a difference between process versus performance standards. Like many state environmental regulations that are at least as protective as the federal law, Mr. Danish suggested using the most stringent standard available. He also commented that delivery systems (e.g., registries) are still emerging and this, too, requires flexibility (i.e., how the credits will be treated under future regimes). He concluded by emphasizing that CMM is subject to uncertainties and risk, which can be best addressed through good documentation for optionality/flexibility (i.e., contracts) and continued responsibility (e.g., monitoring and influencing policy developments) as the carbon market emerges.

Questions / discussion highlights:

Mr. Wasilko commented that he has spent a lot of time educating buyers about offsets and the cost/time element is huge.

- Mr. Danish: early investment in education equals money saved/fees avoided in future lawsuits. Again, he pointed to due diligence and flexibility as best legal strategies.

Ms. Franklin: given the uncertainties, does Mr. Danish advise action now or to wait?

- Mr. Danish: On the one hand there are risks, on the other, opportunities and benefits of early action. The price might be lower now based on the level of risk (e.g., uncertainty) but delay should be considered if domain over the project is questionable. There is also concern whether it might be viewed as an offset versus early action.

Mr. Townsend: what about the likelihood of forced action?

- Mr. Danish indicated that it is already happening now that the Supreme Court has ruled that EPA can regulate carbon dioxide under CAA. He hopes Congress will get its act together and pass legislation before EPA has to step up. He admitted it was tricky to cover all scenarios for what might happen. Mr. Bloomgarden inquired about the macro-level aspects of the DC Circuit Court invalidation of the interstate rule and its impacts on the CAA. Mr. Danish explained the challenge to setting up cap-and-trade programs and acknowledged there might be a renewed call from the power sector to promote a comprehensive program for all pollutants amidst turmoil in the air arena. Mr. Wasilko asked if Congressional staff was involved in these various discussions and Mr. Danish responded affirmatively.

Ms. Nicole Fabri with Clear Energy Brokerage & Consulting LLC commented that as a renewable energy credit (REC) broker, it has been her experience that as long as supply and demand is properly set annually (i.e., matching price is strong enough to encourage projects), one should not cap offsets or set percent contribution in RPS. The goal is to build new renewable sources, not impede emissions reductions.

- Mr. Wasilko agreed and pointed out that “a ton is a ton,” and it should not matter where it came from as long as the cap is met. He added that the purpose is cost-effective transformation of the energy sector, not to drive out coal fired power plants. Offsets can serve as a bridge, but too many options and unknowns persist.

Carbon Financing Opportunities for U.S. CMM Projects: Panel Discussion

Ben Patton, 3Degrees

Eron Bloomgarden, EcoSecurities

Nathan Clark, CCX

Mark Wasilko, AES

Ms. Rudo introduced the panelists and invited each of them to make a short presentation about their companies and what they do. A majority of this session was devoted to questions and answers.

Mr. Ben Patton with 3Degrees provided a brief overview about his company and its mission to reduce the magnitude of climate change. He indicated a majority of their clients represent industry and public utilities and they are working to educate stakeholders. He explained the concept of Verified Emission Reduction (VERs) as a mechanism to promote methane abatement, renewable energy, and sustainable forestry. He also described RECs.

- Importance of understanding baselines prior to initiating projects, using an example from Kazakhstan where they were trying to claim all projected emissions including the baseline.
- It is 3Degrees’ job to help clients identify and focus on what is being emitted beyond the baseline, and how best to reduce their carbon footprint.

Mr. Bloomgarden: EcoSecurities is the largest and oldest carbon company. He indicated that the carbon market is fragmented in the United States and there is great registry uncertainty. While he was bullish on the concept of CMM projects, he said they do look like an offset but perhaps that will be subject to change if CMM falls into a compliance versus voluntary system. There are several challenges to advancing CMM recovery and use, including: lack of CMM developers, gas quality, and the methodology used to derive potential volumes (e.g., leakage from outside wells). CMM recovery projects are not “pretty” projects like tree planting so it is important to focus on the benefits.

Mr. Clark described CCX, a voluntary cap and trade program for U.S. entities that also provides a parallel system in Europe (ECX). Absent mandatory regulations, CCX convened a group of firms to help develop a framework. There are currently 400 entities participating in CCX, 100 of which are large companies. Members make a yearly commitment and audit their activities, then purchase allowances from the market or procure offsets from other projects (e.g., methane capture) to meet annual GHG reduction targets. CCX

has developed a protocol for AMM and benefited greatly from CMOP's input since CCX is comprised mostly of economist, and not technical personnel.

Mr. Wasilko explained that AES is a fully-independent company from General Electric but retains some connection so as to retain large capital reserves from which to draw. GE AES has a vertically-integrated market approach and developed its own standard with recognition that it will need to support a uniform federal program when available. From AES' perspective, the entire process can be viewed as: invest; build, own/operate, and assist; participate in the regulatory regime (i.e., managing own credits); and sell/retail credits. Mr. Wasilko anticipates being able to openly enter the last phase with his peers (e.g., CCX) in the next 3-10 years. He expressed concern about transitioning from a voluntary to a compliance market.

Questions / discussion highlights:

Mr. Liebert inquired about the challenge of "additionality" under the Kyoto Protocol and how it might be viewed by the public, particularly in the United States.

- Mr. Bloomgarden: additionality is critical to project eligibility and reflects U.S. thinking has evolved past several of the CDM constraints and barriers. Additionality is on the trajectory of being a top down performance standards. This is where EPA can help provide input.
- Mr. Wasilko agreed with the comment on performance- versus process-based standards.
- Mr. Patton: he also sees it in the agriculture and landfill sectors. He encouraged stakeholders to include an additionality reference early in the development plan so you can point to it within the document.
- Mr. Marshall: it is important to begin thinking early on about data collection and verification to support your claims.

Mr. Collins asked how best to incorporate carbon tracking from the beginning with so many methodologies (e.g., use the most stringent).

- Mr. Patton recommended it was best to use the most stringent now then perhaps switch in the future, saying buyers tend to be conservative.
- Mr. Clark said end buyers also play a role and might be willing to pay premiums between VERs.
- Mr. Wasilko echoed compliance buyers behavior tends to be conservative while voluntary buyers are a bit looser. It all comes down to defensibility (e.g., standard used).

Mr. Collins: which type of CMM project might be most favorable?

- Mr. Wasilko: he does not perceive a lot of difference between CMM and AMM,
- Mr. Bloomgarden: some developers might look at it from a command-and-control perspective, making active mines more attractive.
- Mr. Liebert: despite the absence of compliance at abandoned mines, he sees more precedence and highest probability with the most stringent standards for AMM.
- Mr. Patton sees things differently for active versus abandoned mines because in reality, money from the active mines might go to the utility.
- Mr. Liebert: additionality for AMM might be too small given the rigorous methodologies to show volume and also demonstrated proven projects in a voluntary market (e.g., precedence).
- Mr. Bloomgarden: the voluntary market is driven by perception as much as reality; he also sees AMM as easier with a straight-forward environmental benefit.
- Mr. Estes pointed to the Elk River example as a wasted resource that could be used to help gain energy independence, but it simply was not couched as environmentally beneficial (i.e., "warm-fuzzy"). Therefore, greater effort needs to be made for putting other perceived values on the use of credits and offset to make them more attractive and appealing.
- Mr. Wasilko: agreed with Mr. Bloomgarden about the need to show the value of AMM (e.g., power resulted from capture and use).

Mr. Patton: explain AES' third-party verification process?

- Mr. Wasilko: it is currently internalized, but it would not be a problem to conform with a uniform standard if asked.

Mr. Marshall: how best to position or approach AMM?

- Mr. Patton: views it as a long-term offset and that methane from active mines might be treated differently.
- Mr. Clark: does not foresee that abandoned mines will be regulated in the future.
- Mr. Marshall: what about gas diffusion and the inability to monitor volumes when it is simply venting. The assumption is that more projects might be available as additional mines are abandoned, also requiring more title work up front.

Mr. Nicholas Duplessis with Biothermica Technologies Inc. commented that VAM is also considered an additionality and they recently received MSHA approval in recent weeks for the Jim Walters demonstration projects (see July 2008 *Extra* article). He expects commissioning by the end of the year and anticipates this will open the door to other VAM projects. He also noted, however, that VAM is treated differently in the United States and China, referring to the thresholds (above 0.3 percent) at which VAM should be collected or recovered.

Wrap-Up / Summary of Key Points

Ms. Rudo thanked the attendees for participating and commented that “from uncertainty comes opportunity.” Before turning the floor over to Ms. Franklin, she also thanked the CMOP staff and roundtable speakers. Ms. Franklin expressed her thanks to everyone, including Ms. Rudo for her facilitation, and added that EPA will be soliciting feedback on the event (e.g., format, length) in a subsequent e-mail. She lastly expressed her hope to see everyone at the CMM conference in October.

The roundtable was adjourned at 4:30 p.m.

Appendix A

U.S. Environmental Protection Agency
Coalbed Methane Outreach Program (CMOP)

**Roundtable Meeting:
Coal Mine Methane
Carbon Finance Opportunities**

July 23, 2008 • Navy League Building • 2300 Wilson Blvd. Arlington, VA

*** AGENDA***

- 8:30 AM **Registration**
- 9:00 AM **Welcome**
Pamela Franklin, U.S. Environmental Protection Agency (U.S. EPA)
- 9:05 AM **Introduction and Overview of roundtable goals and format**
Dianne Rudo, Rudo International Advisors
- 9:30 AM **Identifying US Coal Mine Methane Project Opportunities**
Pamela Franklin, Barbora Jemelkova, Jayne Somers
U.S. EPA Coalbed Methane Outreach Program
- Overview of U.S. project opportunities: active underground coal mines degasification and ventilation air methane, abandoned (closed) coal mines, surface mines
 - Survey of program resources and tools to assist project developers
- 10:30 AM **Refreshment / Networking Break**
- 11:00 AM **Coal Mine Methane Project Developer's Perspective**
Sam McLaughlin and Joe Fink, CNX Gas
- "From the trenches" description of experiences
 - Overcoming challenges working with regulators, mine operators, landowners, etc.
- 12:00 NOON **Lunch Break**
- 1:00 PM **How EPA Can Assist Project Developers and Investors: Discussion**
Pamela Franklin, Barbora Jemelkova, Jayne Somers
Dianne Rudo, moderator
- What tools and resources would be most effective to promote CMM project development, financing in the United States?
 - What role should EPA play in promoting, encouraging project development?

- 1:30 PM **Navigating Legal Challenges to CMM Projects**
Kyle Danish, Van Ness Feldman Attorneys at Law
- How to approach CMM project development, investments, and carbon financing in the United States given the current dynamic, regulatory and legal environment, and how to hedge future risks
- 2: 30 PM **Refreshment / networking break**
- 3:00 PM **Carbon Financing Opportunities for US CMM Projects: Panel Discussion**
Dianne Rudo, Moderator
Ben Patton, 3Degrees
Nathan Clark, Chicago Climate Exchange
Eron Bloomgarden, EcoSecurities
Mark Wasilko, AES
- Topics include:
- Standardizing methodologies
 - Minimizing risk: approaches to project investment and financing
- 4:00 PM **Wrap-up / Summary of Key Points**
Dianne Rudo
- 4:15 PM **Closing Remarks**
Pamela Franklin
- 4:30 PM **Roundtable adjourns**

Appendix B

CMOP Summer Roundtable Speaker Bios *In order of their first appearance on the agenda*

Pamela Franklin

Team Leader

U.S. EPA Climate Change Division, Coalbed Methane Outreach Program

Pamela Franklin serves in the U.S. Environmental Protection Agency's (U.S. EPA's) Climate Change Division as Team Leader of the Coalbed Methane Outreach Program (CMOP). At U.S. EPA, she works with the private sector to reduce greenhouse gas (GHG) emissions cost-effectively from the coal mining sector. She works both in the United States and internationally, including experience in China, India, Russia, and Ukraine. Ms. Franklin serves as the Co-Chair of the Coal Subcommittee for the international Methane to Markets Partnership. She was a Lead Author for the Intergovernmental Panel on Climate Change (IPCC) 2006 Technical Guidelines for emission inventories from the energy sector.

Prior to joining U.S. EPA, Ms. Franklin served as a Congressional Science Fellow, sponsored by the American Association for the Advancement of Science (AAAS). On Capitol Hill, she worked on a range of energy and environmental legislative issues. Ms. Franklin also has several years of experience as an environmental consultant, providing air quality technical and regulatory support for industry and government clients in California.

Ms. Franklin earned a Ph.D. from the Energy and Resources Group at the University of California at Berkeley. She earned an M.S. in Environmental Engineering from Stanford University, and a B.S.E. in Chemical Engineering from Princeton University.

Barbora Jemelkova

Program Manager

U.S. EPA Climate Change Division, Coalbed Methane Outreach Program

Barbora Jemelkova has been a Program Manager at CMOP for 3 years. In this capacity, she focuses primarily on the development and maintenance of technical and marketing tools such as a cost-benefit analysis model for coal mine methane (CMM) projects and a database of over 200 CMM projects operating around the world. As part of CMOP's contribution to the Methane to Markets Partnership, Ms. Jemelkova focuses on providing support to the coal and related industries in Ukraine, Russia, and China.

Prior to joining U.S. EPA, Ms. Jemelkova conducted climate change research for an environmental economic think tank in Washington, DC and worked for an economic consulting firm in Boston on Superfund site remediation.

Ms. Jemelkova has a Masters Degree in Public Policy from the Woodrow Wilson School of Princeton University, with a double concentration in Economics and in science, technology, and environmental policy (STEP).

Jayne Somers
Program Manager
U.S. EPA Climate Change Division, Coalbed Methane Outreach Program

Jayne Somers is a professional engineer with 25 years experience in sustainable energy, environment and capacity building. She is a specialist in mitigating climate change, particularly air pollution control and clean energy projects in the United States, Africa, Asia, Latin America, and East/Central Europe.

Before joining U.S. EPA, Dr. Somers worked with the Wisconsin Department of Natural Resources Air Program and—in 2000—she developed the Madison Climate Protection Plan for the City of Madison Engineering Division. Prior to this, Dr. Somers managed United States Agency for International Development (USAID) global energy and environmental training programs and implemented a USAID technology transfer project in Ghana, West Africa.

Dr. Somers received her Ph.D. from the University of Wisconsin – Madison in integrated strategies for reducing volatile organic compounds and GHG emissions. She holds Bachelor degrees in Engineering and Environmental Science from Rutgers University and a Masters Degree in Energy Management from the University of Pennsylvania.

Sam McLaughlin
General Manager - Northern Appalachian Operations
CNX Gas

Mr. McLaughlin is a mining engineer graduate from West Virginia University, which he attended during the academic year on scholarship from Consol, and worked in the mines each summer during college. He became a full-time Consol employee upon graduating in 1983.

He has been in operations for the vast majority of that time doing everything from being an hourly employee to superintendent of the mine. He has also held the position of manager of industrial engineering for the Northern Appalachia Region.

In September of 2005, Mr. McLaughlin was given the opportunity to move to the gas side and served as a production manager until April 2006, when he was promoted to General Manager of the CNX Gas Northern Appalachia region.

Joe Fink
Project Manager
CNX Gas

Joe Fink is a project manager for CNX Gas Company who has spent the last 8 years working in various capacities for CNX, including control room operations, gas measurement, and project management. His past experience has included working underground in a deep Consol mine for a short time frame.

Most recently, Mr. Fink started a new operation in central Pennsylvania—the Nittany Project. He has taken the project from literally one GPS coordinate to full development and production mode, which has to date drilled 65 CBM wells in 7 months.

Kyle Danish
Member
Van Ness Feldman Law Firm

Kyle Danish advises a range of clients on environmental matters, with a special focus on corporate climate strategy and emissions trading-related transactions. His current clients include electric generation, oil and gas, and mineral exploration companies, as well as manufacturers and think tanks. He is a frequent speaker and has published numerous articles on global warming and emissions trading issues. Mr. Danish also has authored several commissioned research papers on climate change and energy policy for think tanks.

Ben Patton
Sr. Manager, Origination
3Degrees

Ben Patton joined 3Degrees 2006 and has played a central role in developing the carbon product and supply pipeline. He focuses on 3Degrees' activities in origination and acquisition of Verified Emission Reductions.

Previously, Mr. Patton supported origination and acquisition of the company's Renewable Energy Certificate supply for 3Degrees and has contributed to the development of internal financial processes, tracking, and company reporting processes. Mr. Patton joins the company after working as a risk management consultant with BancWare ERisk in New York, where he designed and built models and tools to assess historical credit risk, project loan losses, and evaluate current rating systems.

Nathaniel Clark
Director, Offset Projects
Chicago Climate Exchange

Nathaniel Clark is Director, Offset Projects and an Economist at Chicago Climate Exchange, the world's first and North America's only active, voluntary, legally binding integrated trading system to reduce emissions of all six GHGs, with offset projects in North America and worldwide.

Mr. Clark previously worked as a summer associate with Community Habitat Finance International (CHF). His work with CHF Serbia as an Economic Development Officer focused on sustainable economic development in the agriculture sector in southern Serbia and the former United Nations Former Ground Safety Zone between Serbia and Kosovo. While at CHF Serbia, he also aided in the design phase of their country-wide environmental program strategy.

Prior to his international work, Mr. Clark was a research associate in the Department of Agricultural Economics at the University of Kentucky College of Agriculture.

Eron Bloomgarden
Country Director, United States
EcoSecurities

Having spearheaded EcoSecurities' move in to the North American carbon market, Eron Bloomgarden manages all aspects of EcoSecurities' United States operations including origination, strategic planning, project development and policy. Having extensive experience in the areas of carbon finance and

emissions reduction project development, he has managed and orchestrated many global carbon market milestones, having worked on the first Clean Development Mechanism (CDM) project in the world to receive carbon credits and the first unilateral CDM project. Mr. Bloomgarden has advised governments, multilateral institutions and international corporations on many aspects of the emerging GHG market.

Prior to joining EcoSecurities, he worked as a consultant for the United Nations, and with the Rainforest Alliance and at IBM. Mr. Bloomgarden holds a Masters degree from Columbia University's School of International and Public Affairs (SIPA) in New York, and a Bachelors degree from Pomona College in Claremont, California

Mark Wasilko
Managing Director, Greenhouse Gas Services
AES

Mark Wasilko joined the Alternative Energy business group within AES in February of 2006. In that capacity, he had responsibility for technology assessment and development in the newly formed AES Climate Change group. His responsibilities included identifying and evaluating emerging technologies and projects that would generate reductions in greenhouse gases. He was responsible for new business development which includes the joint development effort with Los Alamos National Laboratories to develop and launch a new energy efficiency product for large commercial data centers.

He is currently the Managing Director of Greenhouse Gas Services, responsible for new technology development and project origination for the newly formed AES/GE joint venture.

Prior to joining AES, Mr. Wasilko had more than 25 years experience in new product and business development. He was an original founder in a computer software company in Arizona. He has held senior management positions in operations and marketing and business development in both U.S. and international markets.

He received his Bachelors degree in Business from Miami University and currently sits on several executive advisory boards.